

REMARKS/ARGUMENTS

Claims 1-22 are currently pending in this application. In the specification, the title has been changed. Applicants submit that no new matter has been introduced into the application by this amendment.

Claim Rejections - 35 USC § 102(b)

Claims 1, 3, 5-9, and 11 were rejected in the Action under 35 USC § 102(b) as anticipated by Suzuki et al. (U.S. Pat. No. 5,739,880). Claims 1, 3, 7-9, 11, 12, 14, 18-20 and 22 were rejected in the Action under 35 USC § 102(b) as anticipated by Sasuga et al. (U.S. Pat. No. 5,432,626).

The Action asserts that claims 1 and 12 are anticipated by Figs. 5(a)-5(c) of Suzuki and Fig. 19 of Sasuga.

Claim 1 of the present invention claims a first substrate, plural scan line metal layers and plural data line metal layers formed on the first substrate, a second substrate attached to the first substrate by applying a seal at a periphery of one of the first substrate and the second substrate, and an opaque layer formed on the second substrate at the inside of the seal, wherein the scan line metal layers and the data line metal layers extend to the outside of the seal and overlap with each other to form an integrated black matrix on the first substrate, which overlaps with the opaque layer on the second substrate. Claim 12 claims the scan line metal layers and the data line metal layers extend to the outside of the seal and overlap

with each other to form an integrated black matrix on the first substrate, which overlaps with the opaque layer on the second substrate. Applicants respectfully submit that such features are not disclosed by Suzuki *et al.* or Sasuga *et al.*

Regarding Figs. 5(a) to 5(c), Suzuki *et al.* discloses a liquid crystal display device having an additional shielding film for shielding light from a light source, in which the region around a display region is reduced. Suzuki *et al.*, fails to disclose that the scan line metal layers and the data line metal layers extend to the outside of the seal and overlap with the opaque layer on the second substrate, so as to form an integrated black matrix for preventing the light leakage, as claimed in claims 1 and 12 of the present invention. More specifically, the liquid crystal display provided by Suzuki et al. includes a black matrix (BM) made of a colored organic resin, and over the periphery of the seal member SL, there are formed portions in which the seal member SL and the black matrix BM are or are not overlapped. The shield tape "TAPE", as outlined in Col. 13, Lines 36-40, is stuck to the lower face of the lower transparent substrate "SUB1" at the portion "where the seal member SL and the black matrix BM are not overlapped" so that the back light "BLL", at the seal portion, can be prevented from leaking, which makes it possible to achieve the liquid crystal display device having a shielding film for shielding light from a light source. Obviously, Suzuki *et al.* fails to disclose that the scan line metal layers and the data line metal layers extend to the outside of the seal and overlap with the

opaque layer on the second substrate for preventing light leakage, as recited in claims 1 and 12 of the present invention

Fig. 19 of Sasuga *et al.* discloses a liquid crystal display device with a shield casing connected to the frame holding the display above the lower casing holding light source. The liquid crystal display device disclosed in Fig. 19 of Sasuga differs from that disclosed in Suzuki in the configuration of the respective leading lines INT of the common transparent pixel electrode ITO2. Specifically, the silver material AGP is applied at the four corners of the lower substrate SUB1 of Sasuga's liquid crystal display device so as to form the respective leading line INT thereon for connecting the pixel electrode ITO2 on the upper substrate SUB2 having the black matrix BM thereto, while the silver material AGP is applied inside the four corners of the lower substrate SUB1 of Suzuki's liquid crystal display device. Therefore, Sasuga *et al.* also fails to disclose that the scan line metal layers and the data line metal layers extend to the outside of the seal and overlap with the opaque layer on the second substrate for preventing the light leakage, as recited in the claims 1 and 12 of the present invention.

The present invention is distinguishable from the cited references as follows. First, in the present invention, the opaque layer, e.g. the black matrix layer or the color filter, is formed on the second substrate at the inside of the seal, as claimed in claims 1 and 12, so that the seal is completely exposed to the UV light to completely

solidify it. Second, as claimed in claims 1 and 12 of the present invention, the scan line metal layers; i.e., the so-called gate metal, and the data line metal layers; i.e., the so-called source and drain metal, extend to the outside of the seal. The extended scan line metal layers and data line metal layers overlap with each other to form an integrated black matrix, so as to prevent a light leakage in the overlapped area and narrow down the frame area of the liquid crystal display. Furthermore, the integrated black matrix also overlaps with the opaque layer on the second substrate.

Based on the above, it is clear that the technical features of the present application are distinguished from the cited references. Applicants respectfully submit that claims 1 and 12 are allowable over the cited references.

Because claims 1 and 12 are allowable, claims 3, 5-9, 11, 14, 18-20 and 22, which depend therefrom, are also allowable. Withdrawal of the rejections under § 102 is requested.

Claim Rejections - 35 U.S.C. §103

Claims 2, 10, 13 and 21 were rejected in the Action under 35 U.S.C. § 103(a) as unpatentable over Suzuki or Sasuga in view of Lee *et al.* (US Pat. No. 6,879,369). Claims 4 and 15 were rejected in the Action under 35 U.S.C. 103(a) as unpatentable

over Suzuki or Sasuga in view of Colgan *et al.*, US 6,057,903. Claims 16 and 17 were rejected in the Action as unpatentable over Sasuga in view of Suzuki.

Lee *et al.* discloses a liquid crystal display structure manufactured by the ODF process, which includes a substrate with transparent conductive patterns. The technical features of the provided structure exist in the transparent conductive layer as well as the UV-type seal, so as to allow the UV light to pass therethrough and thereby pre-curing the UV-type seal.

Colgan *et al.* discloses a liquid crystal display device employing a guard plane layer between a layer for measuring a touch position and a common electrode layer. Such a structure is integrated into the liquid crystal display device and developed for measuring the contact position of a portion of the human body.

The respective technical issues to be solved in Lee *et al.* and Colgan are completely irrelevant to those in the present invention. Even if the references could be combined to suggest the use of the ODF process to fabricate a liquid crystal display, to use the seal that is solidified by a UV light, and to use the black matrix that is made of a colored resin for improving the display quality, the references fail to show the claimed feature of the present invention, which is that the integrated black matrix formed by the overlapped scan line metal layers and data line metal

layers on the second substrate (the TFT substrate), and the technical effect resulting therefrom.

It may be known to one skilled in the art that UV damage is always a critical factor for the ODF process for the liquid crystal display device fabrication. To solidify a UV type seal for sealing the liquid crystal filled between the two substrates, one needs to apply the UV light thereto, and the seal has to be completely exposed to the UV light to obtain a better solidification effect. In such a situation, to prevent the liquid crystal material from being damaged by the UV light, the liquid crystal in the active area must be protected by a UV shield while being exposed thereto. It is the simplest way for solving the mentioned issue to use the combination of the color resistance of the color filter and the black matrix as a UV shield of the active area, as recognized in the present invention. In such a case, the seal must be located at the area outside the black matrix, so as to fully be exposed to the UV light for better solidification. In order to prevent the seal from being shielded by the black matrix, the seal needs to be located at a distance from the active display area. Such manner, however, results in an increase of the frame area including the black matrix and the seal, and further reduces the effective utilization area of the substrate for display.

For overcoming these issues, the present invention provides a novel design for allowing the seal to be fully exposed to the UV light, i.e. forming an integrated

black matrix by the overlapped scan line metal layers and data line metal layers on the TFT substrate, as recited in claims 1 and 12, rather than the substrate having the conventional black matrix and color filter. The mentioned metal layers are deposited and patterned in the frame area of the substrate in the TFT manufacturing process, so as to form a UV shield, i.e., the integrated matrix, thereon.

According to the present invention, the integrated black matrix formed on the TFT substrate overlaps with the opaque layer on the other substrate of the liquid crystal display and functions as a shield for preventing the light leakage in the overlapped area so as to reduce the frame area of the liquid crystal display in a simple and cost-efficient way. Therefore, it is apparent that the integrated black matrix is completely different from the conventional black matrix (the opaque layer as termed in the present invention) of the mentioned liquid crystal display in the respects of function and formation. Through the present invention, the liquid crystal is well protected from UV exposure by the integrated matrix without needing to dispose the seal at a distance from the active display area of the substrate, and thus the effective utilization area of the substrate for display would be enlarged and improved. Accordingly, the provided liquid crystal display with the narrowed frame area has an improved potential for being applied in a portable product.

It is believed that these advantages are not achievable by the respective liquid crystal display provided by the four references, in part, because the novel design for the integrated black matrix formed from the overlapped scan line metal layers and the data line metal layers is not disclosed in any of the four references. The alleged black matrix as well as the color filter in both Suzuki's and Sasuga's references relate to the basic components of the liquid crystal display, which shall not be regarded as the integrated black matrix formed by the overlapped scan line metal layer and the data line metal layer. Applicants respectfully assert that the novelty and the improvement of the integrated black matrix should not be ignored.

Based on the above remarks, it is apparent that the technical features of the present application are distinguishable and an improvement over the cited references. Therefore, Applicants respectfully submit that claims 1 and 12 are allowable. Withdrawal of the § 103 rejections is requested.

Regarding the other claims rejected by the Examiner, which include claims 2-11, and 13-22, since the present application is distinguishable in the present claims 1 and 12, which should be patentable, the above dependent claims should also be patentable.

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that an


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interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned at the Examiner's convenience.

In view of the foregoing remarks, Applicants respectfully submit that the present application, including claims 1 - 22, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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